



## **Rule on Work Zone Safety and Mobility**

**Implementation, Maintenance, and Safety  
Guidelines**

**February 2, 2009**

## **Rule on Work Zone Safety and Mobility**

### **South Carolina Department of Transportation**

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# **Rule on Work Zone Safety and Mobility**

## **South Carolina Department of Transportation**

### **Part I**

## **Implementation of the Rule on Work Zone Safety and Mobility**

### **1.0     Definitions**

**The Rule:** Work Zone Regulations at 23 CFR 630 Subpart J - The Work Zone Safety and Mobility Rule (The Rule) applies to all projects or work conducted by State and local governments in and around work zones on the South Carolina state highway system.

The Rule provides a decision-making framework that requires comprehensive consideration of safety and mobility impacts of work zones during project development stages and the adoption of strategies to manage these impacts during project implementation. The Rule requires state transportation agencies to develop an agency-level work zone and mobility policy to support systematic consideration and management of work zone impacts.

**The Policy:** An agency-level work zone safety and mobility plan that requires development of comprehensive mitigation measures to minimize work zone impacts and enhance safety through maximized mobility; The Policy for Work Zone Safety and Mobility (The Policy).

**Procedures:** Specific work zone traffic control actions and strategies, i.e. lane closures, road closures, detours, etc., to safely control and direct the flow of traffic through the work zone.

**Processes:** A series of actions, strategies, operations, or any combination of the aforementioned to implement The Policy, i.e. planning, development, and implementation of The Policy.

**Policy Review:** An assessment of the processes and procedures enacted to implement The Policy. This will enable the agency to identify any possible shortcomings and provide recommendations for improvements. The Policy review requires evaluation of work zone field data from multiple projects randomly selected statewide. Selected projects should include a variety of characteristics such as day and night work, types of work, project durations, local traffic characteristics such as commuter and tourist, and various traffic control strategies.

**Transportation Management Plan (TMP):** A set of coordinated strategies used to manage the work zone impacts of a project. These strategies will include a Temporary Traffic Control plan, a Transportation Operations component, and a Public Information component. The level of detail, content, and scope of the TMP may vary from project to project based on The Policy and the anticipated work zone impacts of the project. All Federal-aid highway projects require a TMP.

**Temporary Traffic Control plans (TTC):** The primary component of a Transportation Management Plan that addresses traffic control and safety throughout the work zone in compliance with the requirements of Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD) latest edition and SCDOT policies, standards, and procedures.

**Transportation Operations (TO):** A secondary component of a Transportation Management Plan that addresses management of traffic operations in the work zone impact area.

**Public Information (PI):** A secondary component of a Transportation Management Plan that addresses communications with the public and entities impacted by the work zone.

**Significant Project:** A project that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered acceptable by the SCDOT. Significant projects typically occupy a location on a major corridor in an urban area and/or a high volume high speed facility and include multiple lane closures or total closure. These projects may occur on either primary or interstate routes. An interstate system project that occupies a location for more than three days with either intermittent or continuous lane closures is considered a Significant project unless an exception is requested and granted.

**Intermediate Project:** A project that typically generates more than minimal traffic disruptions but has not been classified as a Significant project.

**Basic Project:** A construction or maintenance project that generates minimal traffic disruptions.

**Work Zone:** An area of a highway with construction, maintenance, or utility work activities. A work zone is typically marked by signs, channelizing devices, barriers, pavement markings, and/or work vehicles. It extends from the first warning sign or high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle to the “END ROAD WORK” sign or the last temporary traffic control device per *Section 6C.02* of the MUTCD, Edition of 2003.

**Road User:** A vehicle operator or passenger, bicyclist, or pedestrian within the highway. The term “Road User” will not apply to an individual who also meets the definition of a “Highway Worker” within the work zone in which the individual is engaged in highway construction, maintenance, or utility work activities.

**Highway Worker:** Person or persons on foot or on or within highway work equipment or a highway work vehicle whose duties place them within the right-of-way of a Federal-aid highway, such as highway construction and maintenance forces, survey crews, utility crews, responders to incidents within the highway right-of-way, and law enforcement personnel when directing traffic, investigating crashes, and handling lane closures, obstructed roadways, and disasters within the right-of-way of a Federal-aid-highway. For purposes of this policy, and to ensure consistency in work zone operations statewide, the definition of “highway worker” will apply to all those listed whose duties place them within the right-of-way of any street or highway for which the SCDOT is responsible.

**Close Proximity:** Means within the highway right-of-way on Federal Aid highways and on any street or highway for which SCDOT is responsible.

**High Visibility Safety Apparel:** Personal protective safety clothing that is intended to provide conspicuity during both daytime and nighttime usage, and that meets the Performance Class 2 or 3 requirements of ANSI/ISEA 107-2004 publication entitled “American National Standard for High-Visibility Safety Apparel and Headwear”.

**Mobility:** Mobility is the ability to move from place to place and is significantly dependent upon the availability of transportation facilities and on system operating conditions. With specific reference to work zones, mobility pertains to moving road users efficiently through or around a work zone area with a minimum delay compared to baseline travel when no work zone is present, while not compromising the safety of highway workers or road users. The commonly used performance measures for the assessment of mobility include delay, speed, travel time, and queue length.

**Safety:** Safety is a representation of the level of exposure to potential hazards for users of transportation facilities and highway workers. With specific reference to work zones, safety refers to minimizing potential hazards to road users in the vicinity of a work zone and highway workers at the work zone interface with traffic. The commonly used measures for highway safety are the number of crashes or the consequences of crashes (fatalities and injuries) at a given location or along a section of highway during a period of time. Highway worker safety in work zones refers to the safety of workers at the work zone interface with traffic and the impacts of the work zone design on worker safety. The number of worker fatalities and injuries at a given location or along a section of highway, during a period of time are commonly used measures for highway worker safety.

**Work Zone Crash:** A Work Zone Crash means a traffic crash in which the first harmful event occurs within the boundaries of a work zone or on an approach to or exit from a work zone, resulting from an activity, behavior, or control related to the movement of the traffic units through the work zone. This includes crashes occurring on approach to, exiting from or adjacent to work zones that are related to the work zone.

**Work Zone Impacts:** Work zone impacts refer to work zone-induced deviations from the normal range of transportation system safety and mobility. The extent of the work zone impacts may vary based on factors such as road classification, area type (urban, suburban, and rural), traffic and travel characteristics, type of work being performed, time of day/night, and complexity of the project. These impacts may extend beyond the physical location of the work zone itself, and may occur on the roadway on which the work is being performed, as well as other highway corridors, other modes of transportation, and/or the regional transportation network.



## **Implementing The Policy**

### **2.0 Responsible Persons - Implementing The Policy**

SCDOT staff, including but not limited to, personnel from headquarters, district offices, and resident engineer offices, and designated representatives acting on behalf of the SCDOT, will implement The Policy. FHWA is a partner and an advisor and will have a primary role along with the SCDOT in implementing The Policy. Also, the SCDOT will select representatives impacted by work zones from outside the SCDOT to assist in the implementation of The Policy.

The following SCDOT offices will participate in the implementation of The Policy as necessary. Specific representatives will be selected by office Directors and District Engineering Administrators.

#### **SCDOT Representative Offices -**

- Deputy Secretary for Engineering
- Planning
- Pre-Construction
- Construction
- Maintenance
- Safety
- Traffic Engineering
- Engineering District Offices
- Resident Engineer Offices
- Communications

Representatives from the following external entities may be invited to participate in the implementation of The Policy as necessary. The FHWA will have a standing invitation to participate.

#### **External Representatives -**

- FHWA
- Association of General Contractors
- Law Enforcement
- Regional Associations (Impacted by the work)
- Local EMS
- Fire Departments
- Transit Agencies
- SC Department of Education/ Pupil Transportation Division

Refer to *Table 1 – Implementation Process of The Policy* as a guideline to the process for implementing The Policy.

**Table 1. Implementation Process of The Policy**

Classify Projects		Planning Traffic Engineering FHWA	
Significant Project	Intermediate Project	Basic Project	
Compile Project Data	Compile Project Data	Compile Project Data	Standard Project Development Process
Develop TMP Needs	Develop TMP Needs	Develop TMP Needs	Pre-Construction or Maintenance Traffic Engineering FHWA
Identify Impacted Entities	If TO and PI components are required, follow guidelines under the “Significant Project” classification.  If TO and PI components are not required, develop TTC and go to “Implement TMP”	Develop TTC and go to “Implement TMP”	
Develop TMP Team			
TMP Development			
Monitor TMP Development			
Evaluate			
Finalize TMP			
Re-Evaluate Proposed TMP			
Implement TMP	Implement TMP	Implement TMP	Responsible Persons

**(Continued Next Page)**

**Table 1. Implementation Process of The Policy  
(Continued)**

Monitor TMP Field Performance	TMP Team Responsible Persons	Monitor TMP Field Performance	Responsible Persons	Monitor TMP Field Performance	Responsible Persons
TMP Update Per TMP Evaluation	TMP Team Responsible Persons	TMP Update Per TMP Evaluation	Responsible Persons	TMP Update Per TMP Evaluation	Responsible Persons
Evaluate TMP Update	TMP Team Responsible Persons	Evaluate TMP Update	Responsible Persons	Evaluate TMP Update	Responsible Persons
Post Project TMP Evaluation and Performance Assessment	Project Review Team				
Analyze Multiple Project Reviews The Policy Performance Assessment	Policy Review Team				

### **3.0     Development of Awareness of The Policy**

The SCDOT shall provide information and education regarding The Policy to all representatives responsible for implementing The Policy. The SCDOT will develop methods to provide information and education as follows:

- Educate the SCDOT staff, consultants, and contractors about The Policy and The Policy provisions, actions, and goals. Make presentations to these groups that will provide opportunity for question and answer sessions.
- Provide education and information regarding The Policy to the media, regional entities, community and business representatives, and local political leaders impacted by a highway work zone as necessary. Effective education efforts may include and vary from general public service advertisements to the motoring public to in-depth presentations, publication of brochures, development of web messaging, and other appropriate strategies.
- Include policy provisions in the latest editions of the “Construction Manual”, “SCDOT Maintenance Manual”, “Standard Specifications for Highway Construction”, “Standard Drawings for Road Construction”, applicable supplemental specifications, and the project special provisions.
- Provide training to SCDOT staff responsible for planning, designing, implementing and evaluating the implementation and effectiveness of a transportation management plan. The training will also be made available, when feasible, to SCDOT consultants, contractors, utilities, and local government personnel.

### **4.0     Work Zone Performance Standards**

Through implementation of The Policy, the SCDOT will develop, establish, and implement advanced and effective performance standards for work zone safety, mobility, and constructability. However, the SCDOT will utilize current performance standards to evaluate work zone safety, mobility, and constructability during the initial implementation of The Policy. Due to the requirement for the Policy Review Team to meet no less than once every two (2) years, the SCDOT shall complete the development of the new performance standards for evaluation by the Policy Review Team and implementation into The Policy prior to the end of the first two (2) year term, October 1, 2009.

The Policy Review Team will assign the development tasks of the new performance standards. Upon completion of the development of the new standards, the Policy Review Team will accept submittal of the proposed standards for evaluation. When determined acceptable, the Policy Review Team will forward the proposed standards to the Deputy Secretary for Engineering for final review and approval to incorporate the new standards into The Policy for implementation. Current agency procedures for policy change will be followed.

The Policy Review Team will conduct evaluations of work zone data compiled from multiple Project Reviews to evaluate the effectiveness of The Policy in accordance with the performance standards. The team will present its findings annually to the Deputy Secretary for Engineering. When work zone field data and periodic project evaluations indicate performance shortfalls, The Policy requires the SCDOT to consider alternate highway industry accepted strategies to meet the desired goals as recommended by the Policy Review Team.

### **Performance Standards**

The new advanced work zone performance standards developed during the initial implementation period of The Policy will comply with the following descriptions and requirements.

**Safety (Road User):** These performance standards should provide a collision (or crash) rate per mile for crashes that involve Road Users, as defined heretofore, and is directly related to roadway conditions generated by the presence of a work zone. The standards will permit the Resident Engineer to ascertain the number of work zone related crashes within the work zone limits and determine if the number of crashes is high, average, or low for the work zone category. The standards will require consideration of only those collisions proven to be related to the roadway conditions resulting from previous or currently active work activities consequent of the presence of the work zone. These standards will exclude crashes with no direct relation to the conditions generated by the presence of the work zone.

**Safety (Highway Worker):** These performance standards should provide an accident analysis method for accidents that involve Highway Workers, as defined heretofore. The standards will permit the Safety Office to ascertain the number and types of work zone related accidents within the work zone limits. These standards will also provide methods for analysis of the causes of the accidents that will provide data to facilitate development of countermeasures to future occurrences of similar accidents.

**Mobility:** These performance standards will provide for analysis and evaluation of possible delay to motorists, reduction of highway capacity, or reduction of the efficiency of traffic operations within the work zone or the surrounding area generated by the presence of the work zone. Also, these standards will provide for evaluation of the effectiveness of the measures utilized to minimize impacts such as hourly prohibition restrictions, alternative roadway design features, ITS technologies, etc. These standards will provide the facilities for the Resident Engineer to determine the degree of the impact and if the impact is acceptable or non-acceptable.

**Constructability:** These performance standards will address the constructability of the project. The standards will permit the Resident Engineer to determine if the entity responsible for conducting the work is experiencing any problems related to the project constructability.

**Work Zone Categories for Performance Standards**

Categorize the types of projects to permit the performance standards to consider the work zone conditions relative to the work zone category.

- Interstate Rehabilitation
- Interstate Widening
- Primary Widening
- Primary Intersection Improvement
- Bridge Construction / Maintenance
- Maintenance
- Federal-Aid Resurfacing
- C-Projects
- Encroachment Permits

## **5.0 Processes and Procedures for Policy Implementation**

Utilize these processes and procedures for guidance to streamline and standardize work zone safety and mobility practices. Consider the following processes and procedures to streamline decision-making and improve uniformity.

### **Processes**

- **Process 1** - Implement the classification guidelines found in “Table 2” and “Table 3” for classifying projects and identifying Significant projects.
- **Process 2** - Maintain a listing of specific types of projects and specific types of work for a blanket exception from classification as Significant projects.
- **Process 3** - The Policy Review team will review Process 1 and Process 2 to evaluate the effectiveness of these processes and to determine if revisions are prudent.

### **Procedures**

#### **Planning Phase**

- Identify and coordinate with local and regional transportation planning organizations, local government authorities, law enforcement, emergency services, businesses, schools, regional associations, and utilities impacted by the work.
- Identify and coordinate with local public transportation authorities capable of providing alternate facilities for transporting persons, goods, etc. through or around the work area.

#### **Design Phase**

- For high volume high speed corridors, utilize the same roadway design principles for temporary roadways, roadway alignments, intersection configurations, etc., as utilized for permanent facilities.
- Minimize work zone impacts through design alternatives when feasible. Consider possible alternatives to pavement design, roadway and bridge design, materials, etc.
- Ensure sufficient right-of-way acquisition to provide for temporary roadways, including but not limited to pavement, shoulders, fills, and slopes during stage construction.

### **Plans Development Phase**

- Design and develop a work zone temporary traffic control plan (TTC) for inclusion in Significant, Intermediate, and Basic Transportation Management Plans (TMP).
- Design and develop a work zone transportation operations plan (TO) for inclusion in Significant Transportation Management Plans (TMP). Also, elements of a TO plan may be required for an Intermediate TMP.
- Design and develop a work zone public information plan (PI) for inclusion in a Significant Transportation Management Plan (TMP). Also, elements of a PI plan may be required for an Intermediate TMP.
- Develop a transportation management plan (TMP).
- Specify maintenance of traffic strategies such as flagging operations, lane closures, shoulder closures, road closures with detours, etc.
- Specify hourly prohibition restrictions to minimize traffic delay resulting from lane closures, shoulder closures, temporary road closures, flagging operations, or any reduction of highway capacity. On Interstate facilities, consider lane closures when the travel lanes remaining open to traffic will not exceed a traffic volume of 1000 vehicles per hour per lane per direction. On primary multilane facilities, consider lane closures when the travel lanes remaining open to traffic will not exceed a traffic volume of 800 vehicles per hour per lane per direction.
- Consider project specific traffic queue thresholds when feasible.
- Specify alternate routes for through traffic when alternate routes are available and are viable alternatives. Also, install and maintain the necessary signing for the alternate routes.
- Specify advance warning, regulatory, guidance, and information signing plans in the work zone temporary traffic control plans.
- Design and develop the work zone temporary traffic control plans to permit maintenance of the speed limits in place prior to beginning work unless temporary roadway alignments and geometry necessitate a speed limit reduction.
- Design and develop the work zone temporary traffic control plans to include installation of temporary concrete barrier wall for separation of two-lane two-way traffic when reducing an existing multiple lane roadway with an earth median to a temporary two-lane two-way facility without an earth median.
- Consider upgrading and/or widening shoulders if considered feasible to facilitate traffic movement.
- Specify minimum lane widths of 11-foot plus 2-foot offsets adjacent to longitudinal barriers or other traffic control devices.
- Specify a minimum 26 foot wide roadway during bridge staging.
- Restrict the maximum length of lane closures to 2 miles unless otherwise approved by the Engineer.
- Specify improvements to alternate routes to include but not limited to installation of temporary traffic signals and roadway resurfacing prior to beginning the work where feasible.
- Coordinate with local and regional transportation planning organizations, local government authorities, law enforcement, emergency services, businesses, schools, regional associations, and utilities impacted by the work.



### **Construction Phase**

- Install and maintain proper traffic control devices and pavement markings to provide delineation and channelization as required by the work zone temporary traffic control plans, the SCDOT, and the MUTCD.
- Request and utilize law enforcement to enforce all traffic laws in the work zones and to assist with traffic control during temporary road closures.
- Consider roadside assistance services within project limits on high volume high speed roadways.
- Consider wrecker services within project limits on high volume high speed roadways with limited shoulder areas for disabled vehicles to utilize.
- Maintain access for emergency services.
- Consider proven ITS technologies to provide motorists with current information regarding traffic delays, lane closures, and alternate routing that will improve the efficiency of traffic movement through work zones.
- Utilize various media outlets for distribution of information. Provide accurate and timely updates of travel conditions and work activities.

### **Miscellaneous**

- Train personnel in work zone traffic control practices pertinent to the individual's job duties. Ensure traffic control training as well as other pertinent training deemed suitable by the SCDOT is available for all parties with responsibilities relevant to the project to include but not limited to SCDOT road design, bridge design, construction, maintenance, contractors, law enforcement officers, and roadside assistance personnel.
- Utilize innovative contracting clauses (A+B, lane rental, incentive/disincentive, etc.) to reduce work zone impacts by minimizing the duration of the contract and the durations of lane closures, road closures, detours, etc.

## **Project Classification**

### **6.0 Classifications**

Classify all highway projects into one of three classifications:

#### **Significant**

A project that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered acceptable by the SCDOT. These projects typically occupy a location on a major corridor in an urban area and/or a high volume high speed area and include multiple lane closures or total closure. These projects may occur on either primary or interstate routes. An interstate system project that occupies a location for more than three days with either intermittent or continuous lane closures is considered a Significant project unless an exception is requested and granted.

#### **Intermediate**

A project that typically generates more than minimal traffic disruptions but has not been classified as a Significant project.

#### **Basic**

A construction or maintenance project that generates minimal traffic disruptions.

### **7.0 Determining Significant Projects**

A Significant project is typically characterized by one or more of the following characteristics:

1. Occupies a location on a high volume high speed corridor for more than three days with either intermittent or continuous lane closures.
2. Includes multiple lane closures or total closure of a major corridor.
3. Generates significant user costs with long durations.
4. Impacts a high number of motorists and generates moderate to high level public interest.

Consider if the project exhibits any of the above characteristics and the magnitude and extent of the anticipated work zone impacts when determining if the project is significant.

The SCDOT will identify projects in the Statewide Transportation Improvement Program (STIP) that are anticipated to be Significant and Intermediate during the systems planning phase of project development. The Planning and Traffic Engineering offices and FHWA will coordinate and conduct annual evaluations of the STIP to identify and classify probable Significant and Intermediate projects. Early identification of probable Significant and Intermediate projects will enable early consideration of

work zone impacts and scheduling to minimize the impacts on road users, businesses, etc. during the project development process. However, projects identified as Significant early in the process may be reclassified as an Intermediate or a Basic project if circumstances related to the project change as the project development process progresses. Also, Intermediate and Basic projects may be reclassified if circumstances related to these projects change as the project development process progresses.

## **8.0     Work Zone Project Classifications**

Utilize *Table 2 – Work Zone Characteristics* to evaluate the characteristics of the work zone. The characteristics included in *Table 2* will assist the evaluation and classification of the project.

Utilize *Table 3 – Work Zone Impact Types Classification* to evaluate the impacts of the work zone. The characteristics included in *Table 3* will utilize impact level criteria to classify a project. This evaluation will categorize each project into one of four types. Type I and Type II projects are Significant, Type III projects are Intermediate, and Type IV projects are Basic.

**Table 2. Work Zone Characteristics**

<b>WORK ZONE CHARACTERISTICS</b>	<b>DESCRIPTION</b>
<b>ROADWAY CLASSIFICATION</b>	<input type="checkbox"/> Interstate <input type="checkbox"/> Primary <input type="checkbox"/> Secondary
<b>AREA TYPE</b>	<input type="checkbox"/> Urban <input type="checkbox"/> Rural
<b>TRAFFIC DEMAND TYPE CHARACTERISTICS</b>	<input type="checkbox"/> Commuter <input type="checkbox"/> Seasonal <input type="checkbox"/> Special Event <input type="checkbox"/> Non-Descript
<b>TYPE OF WORK</b>	<input type="checkbox"/> Maintenance <input type="checkbox"/> Reconstruction <input type="checkbox"/> New Construction / New Location <input type="checkbox"/> Widening <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Bridge Replacement <input type="checkbox"/> Bridge Repair <input type="checkbox"/> Encroachment Permits
<b>TYPE OF WORK ZONE</b>	<input type="checkbox"/> Long Term - More than 3 days <input type="checkbox"/> Intermediate Term - 12 hours to 3 days <input type="checkbox"/> Short Term - 1 hour to 12 hours <input type="checkbox"/> Short Duration - Up To 1 Hour <input type="checkbox"/> Mobile - Moves continuously (NO stops)
<b>LEVEL OF CONFLICT - TRAFFIC / WORK AREA</b>	<input type="checkbox"/> Lane Closures <input type="checkbox"/> Shoulder Closures <input type="checkbox"/> Temporary Road Closures <input type="checkbox"/> Detours <input type="checkbox"/> Lane Width Reductions
<b>POTENTIAL IMPACTS - LOCAL HIGHWAY NETWORK, BUSINESSES, PROPERTY OWNERS, ETC.</b>	<input type="checkbox"/> Minimal <input type="checkbox"/> Average <input type="checkbox"/> High Impact

**Table 3. Work Zone Impact Types Classification**

TYPES	CHARACTERISTICS	EXAMPLES
<b>TYPE I</b> (Significant)	<ul style="list-style-type: none"> <li><input type="checkbox"/> Affects the traveling public at the metropolitan, regional, intrastate, and / or the interstate level.</li> <li><input type="checkbox"/> Very high level of public interest.</li> <li><input type="checkbox"/> Directly affects a very large number of travelers.</li> <li><input type="checkbox"/> Significant user cost impacts.</li> <li><input type="checkbox"/> Long duration.</li> <li><input type="checkbox"/> Requires multiple lane closures or temporary road closures or any periodic or extended reduction of highway capacity on a four lane Interstate route with an AADT that exceeds 20,000.</li> <li><input type="checkbox"/> Requires multiple lane closures or temporary road closures or any periodic or extended reduction of highway capacity on a four lane Primary route with an AADT that exceeds 15,000.</li> <li><input type="checkbox"/> Requires hourly prohibition restrictions for lane closures, shoulder closures, temporary road closures, flagging operations or any reduction of highway capacity that impact the work schedule.             <ul style="list-style-type: none"> <li>• On interstate facilities, lane closures or any reduction of highway capacity is only permitted when the travel lanes remaining open to traffic will not exceed a traffic volume of 1000 vehicles per hour per lane per direction.</li> <li>• On primary multilane facilities, lane closures or any reduction of highway capacity is only permitted when the travel lanes remaining open to traffic will not exceed a traffic volume of 800 vehicles per hour per lane per direction.</li> </ul> </li> <li><input type="checkbox"/> Impacts upon corridor and network transportation operations, including parallel corridors, alternate routes, adjacent concurrent work zones, etc.</li> <li><input type="checkbox"/> Impacts upon adjacent transportation infrastructure such as major intersections, interchanges, railroad crossings, etc.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I-385 north of I-85</li> <li><input type="checkbox"/> Arthur Ravenel Bridge</li> <li><input type="checkbox"/> US 501 west of Intracoastal Waterway</li> </ul>

**Table 3. Work Zone Impact Types Classification  
(Continued)**

TYPES	CHARACTERISTICS	EXAMPLES
<b>TYPE II</b> (Significant)	<ul style="list-style-type: none"> <li><input type="checkbox"/> Affects the traveling public predominantly at the metropolitan and regional level.</li> <li><input type="checkbox"/> Moderate to high level of public interest.</li> <li><input type="checkbox"/> Directly affects a moderate to high number of travelers.</li> <li><input type="checkbox"/> Moderate to high user cost impacts.</li> <li><input type="checkbox"/> Moderate to long duration.</li> <li><input type="checkbox"/> Requires multiple lane closures or temporary road closures or any periodic or extended reduction of highway capacity on a four lane Interstate route with an AADT that exceeds 20,000.</li> <li><input type="checkbox"/> Requires multiple lane closures or temporary road closures or any periodic or extended reduction of highway capacity on a four lane Primary route with an AADT that exceeds 15,000.</li> <li><input type="checkbox"/> Requires hourly prohibition restrictions for lane closures, shoulder closures, temporary road closures, flagging operations or any reduction of highway capacity that impact the work schedule.             <ul style="list-style-type: none"> <li>• On interstate facilities, lane closures or any reduction of highway capacity is only permitted when the travel lanes remaining open to traffic will not exceed a traffic volume of 1000 vehicles per hour per lane per direction.</li> <li>• On primary multilane facilities, lane closures or any reduction of highway capacity is only permitted when the travel lanes remaining open to traffic will not exceed a traffic volume of 800 vehicles per hour per lane per direction.</li> </ul> </li> <li><input type="checkbox"/> Impacts upon corridor and network transportation operations, including parallel corridors, alternate routes, adjacent concurrent work zones, etc.</li> <li><input type="checkbox"/> Impacts upon adjacent transportation infrastructure such as major intersections, interchanges, railroad crossings, etc.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Major corridor reconstruction.</li> <li><input type="checkbox"/> High-impact interchange improvements.</li> <li><input type="checkbox"/> Full closure of high-volume facilities.</li> <li><input type="checkbox"/> Major bridge repair.</li> <li><input type="checkbox"/> Repaving projects that require long term lane closures.</li> </ul>

**Table 3. Work Zone Impact Types Classification  
(Continued)**

TYPES	CHARACTERISTICS	EXAMPLES
<b>TYPE III</b> (Intermediate)	<ul style="list-style-type: none"> <li><input type="checkbox"/> Affects the traveling public at the metropolitan and regional level.</li> <li><input type="checkbox"/> Low to moderate level of public interest.</li> <li><input type="checkbox"/> Directly affects a low to moderate number of travelers.</li> <li><input type="checkbox"/> Low to moderate user cost impacts.</li> <li><input type="checkbox"/> Moderate duration.</li> <li><input type="checkbox"/> May include multiple lane closures or a reduction of highway capacity for a moderate duration.</li> <li><input type="checkbox"/> May include minimal temporary road closures.</li> <li><input type="checkbox"/> Requires hourly prohibition restrictions for lane closures, shoulder closures, temporary road closures, flagging operations or reduction of highway capacity that impact the work schedule.             <ul style="list-style-type: none"> <li>• On interstate facilities, lane closures or any reduction of highway capacity is only permitted when the travel lanes remaining open to traffic will not exceed a traffic volume of 1000 vehicles per hour per lane per direction.</li> <li>• On primary multilane facilities, lane closures or any reduction of highway capacity is only permitted when the travel lanes remaining open to traffic will not exceed a traffic volume of 800 vehicles per hour per lane per direction.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Repaving work on roadways and the National Highway System (NHS) with moderate Average Daily Traffic (ADT).</li> <li><input type="checkbox"/> Minor bridge repair.</li> <li><input type="checkbox"/> Shoulder repair and construction.</li> <li><input type="checkbox"/> Minor interchange repairs.</li> </ul>
<b>TYPE IV</b> (Basic)	<ul style="list-style-type: none"> <li><input type="checkbox"/> Affects the traveling public to a small degree.</li> <li><input type="checkbox"/> Low public interest.</li> <li><input type="checkbox"/> Short to moderate duration.</li> <li><input type="checkbox"/> Work zones are small and typically recurring or mobile.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Pothole patching.</li> <li><input type="checkbox"/> Pavement markings applications.</li> <li><input type="checkbox"/> Guardrail repair.</li> <li><input type="checkbox"/> Minor shoulder repair.</li> <li><input type="checkbox"/> Very minor joint sealing.</li> <li><input type="checkbox"/> Minor bridge painting.</li> <li><input type="checkbox"/> Sign repair.</li> <li><input type="checkbox"/> Mowing.</li> </ul>

## **9.0 Qualifications for Exception as a Significant Project**

A project or work operation, generally classified as a Significant project, may qualify for an exception from the Significant project classification provided the SCDOT can demonstrate to the FHWA that the project or work operation in question will not generate a high level of sustained work zone impacts. Also, the SCDOT may seek a blanket exception for certain categories of projects or work operations that the SCDOT considers not to have sustained impacts.

A project or work operation must be conducted during off-peak hours and in compliance with all hourly prohibition restrictions to qualify for consideration as an exception from classification as a Significant project.

## **10.0 Process for Requesting an Exception as a Significant Project**

The SCDOT must submit to the FHWA a request to approve a project be granted an exception from classification as a Significant project. The exception request will include an assessment of the anticipated work zone impacts and a description of the project and the local conditions.

The process for requesting an exception is as follows:

- Evaluate and compare the anticipated work zone impacts with the requirements of The Policy.
- Prepare the exception request and submit to the FHWA.
- Take appropriate actions upon acceptance or denial of the request.

## **11.0 Blanket Exceptions as Significant Projects**

A blanket exception provides an exception from classification as a Significant project for all projects within a specific category of projects or work operations. All requirements for a single project exception also apply to a blanket exception. A specific project category or work operation must be conducted during off-peak hours and in compliance with all hourly prohibition restrictions as required for a single project exception. The work operations listed below generally have minimal impacts and are considered candidates for a blanket exception from classification as Significant projects. However, if a specific project or work operation should include any aspects that will generate sustained work zone impacts, an appropriate transportation management plan must be developed and implemented.

### **Exception Candidates**

- Mobile operations
- Pavement marking applications conducted under mobile operations
- Permanent signing (ground mounted structures only) installation and repair conducted under shoulder closures
- Cable guardrail repair
- Mowing
- Pothole patching



## **Transportation Management Plans**

### **12.0 Transportation Management Plans**

A Transportation Management Plan (TMP) is a set of coordinated strategies used to manage the work zone impacts of a project. These strategies will include a Temporary Traffic Control plan, a Transportation Operations component, and a Public Information component. The level of detail, content, and scope of the TMP may vary from project to project based on The Policy and the anticipated work zone impacts of the project. All Federal-aid highway projects require a TMP.

#### **TMP Components**

The TMP, dependent upon the project classification, will include a temporary traffic control plan (TTC) component and may also include a transportation operations (TO) component and a public information (PI) component.

**Temporary Traffic Control plans (TTC):** Addresses traffic control strategies and staging in the work zone in compliance with the requirements of the SCDOT and the requirements of Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD), latest edition.

**Transportation Operations (TO):** Addresses management of the traffic operations within the work zone impact area and strategies for minimizing the impact upon traffic operations.

**Public Information (PI):** Addresses communications strategies for providing information to the public and other impacted entities.

#### **Minimum TMP Requirements per Classification**

**Significant Projects:** The TMP shall include a TTC plan and the TO and PI components.

**Intermediate Projects:** The TMP will only require a TTC plan.

**Basic Projects:** The TMP will only require a TTC plan.

Consider including TO and PI components in the TMPs for Intermediate and Basic projects, although these components are optional for these project classifications.

Upon determination of the needs of the TMP, coordinate and establish a Transportation Management Plan Team for each major TMP. A Transportation Management Plan Team will assist during the development of the TMP, monitor the TMP during implementation, and provide constructive input as necessary during the implementation phase of the TMP.

A TMP developed by an entity other than the SCDOT shall require approval by the SCDOT prior to implementation.

### **TMP Development**

Initiate development of the Transportation Management Plan after identification of probable Significant and Intermediate projects during the systems planning phase and progress through all phases of project development. Consider a broad range of strategies during the initial stages and refine these strategies as the development process progresses. Consider acceptable design alternatives that may mitigate the work zone impacts. When dealing with several projects within the same corridor or region, consider scheduling and coordinating the projects to minimize the cumulative impacts of the multiple work zones. Also, when dealing with several projects within the same corridor or close proximity, consider development of a single TMP for all of the projects, however, if a single TMP for the multiple projects is not feasible, coordinate the individual TMPs.

Develop recommendations for potential strategies for managing the work zone impacts early in the project development process to enable inclusion of the costs for the management strategies in the early cost estimates of the project to ensure available funding for implementation of the TMP.

The TMP development process should comply with those procedures included in the following section, *“Procedures for TMP Development, Implementation, Revision, and Evaluation”*.

### **13.0 Procedures for TMP Development, Implementation, Revision, and Evaluation -**

Develop, assess, revise, and implement the TMP as follows:

#### **1. Compile Project Data**

Assemble the initial project data:

- Project scope and roadway and traffic characteristics.
- Information from adjacent projects within the corridor or close proximity for evaluation of the combined or cumulative impact of the projects.
- Preliminary work zone management strategies.
- Preliminary cost estimates for implementation of the proposed work zone management strategies.

During the initial stages of developing the TMP, evaluate each basic element of the project, travel and traffic, and work zone characteristics listed below:

- **Project Characteristics:**
  - Roadway classification (interstate, primary, or secondary).
  - Area type (urban or rural).
  - Project size, length, duration, cost, and complexity.
  - Type of work (maintenance, rehabilitation, reconstruction, widening, bridge replacement, bridge repair, etc.).
  - Type of work zone (long term - more than 3 days, intermediate term - 12 hours to 3 days, short term - 1 hour to 12 hours, short duration - up to 1 hour, mobile - moves continuously {NO stops}).
  - Level of conflict between traffic and work area (full lane closure, temporary road closure, lane closures, shoulder closures, lane width reduction, detours, night work, etc.)
  - Project schedule.
- **Travel and Traffic Characteristics:**
  - Traffic volumes.
  - Variations in traffic volumes (hourly, daily, weekly, or seasonal).
  - Percentages of different vehicular types (cars, trucks, or buses).
  - Type of travel (commuter or tourist).
  - Public and private facility traffic generators (schools, manufacturing plants with shift changes, etc.).
  - Special events (football games, concerts, etc.).
  - Potential weather impacts (hurricanes, hurricane evacuation routes).

- **Work Zone Characteristics:**

- Impacts of the project at both the corridor and network levels to include parallel corridors, alternate routes, other concurrent work zones in the vicinity, etc.
- Impacts on adjacent transportation infrastructure (major intersections and interchanges, railroad crossings, and other aspects of the transportation network).
- Capacity (lane closures, lane width reductions, lane reconfigurations).
- Delay and travel time impacts.
- Level of public interest.
- User cost impacts.
- Safety impacts.
- Impacts on evacuation routes.
- Impacts on public properties (schools, emergency response such as hospitals and fire stations, police stations, recreational facilities).
- Impacts on private properties (residential and business access).

## **2. Determine the TMP Needs**

The minimum TMP requirements depend upon the project classification, Significant, Intermediate, or Basic. The Pre-Construction or Maintenance and Traffic Engineering offices and the FHWA will coordinate and classify the minimum TMP requirements for each project as follows:

- **Major TMP (TTC / TO / PI)**

(Significant Projects / Select Intermediate Projects)

Major TMPs are intended for Significant projects. A major TMP will address impacts such as multiple lane closures and road closures within vital corridors in urban areas and on the interstate system and impacts that generate moderate to high level public interest. A major TMP will include a TTC plan and TO and PI components. Also, a major TMP will include an analysis of potential impacts of the traffic management strategies, any possible secondary mitigation strategies, coordination strategies for entities impacted by the work zones, and the TMP cost estimates.

- **Intermediate TMP (TTC / May include TO Elements / PI Elements)**

(Intermediate Projects)

Intermediate TMPs are intended for construction and maintenance projects that are anticipated to have more than minimal traffic disruptions but have not been classified as Significant projects. These projects will impact a moderate number of motorists and generate a low to moderate level of public interest. An Intermediate TMP will include a TTC plan and will include some TO and PI strategies. Also, the TMP may include the TMP cost estimates.

- **Basic TMP (TTC)**

(Basic Projects)

Basic TMPs are intended for construction and maintenance projects with minimal traffic disruptions. A Basic TMP will include a TTC plan. TO and PI strategies are not required for a Basic TMP.

### 3. Identify Impacted Entities / Develop TMP Team

- **Identification of Impacted Entities**

Identify all entities impacted by the work zone. Acquire vital information regarding the work zone impacts upon these entities to better determine the strategies to include in the TMP. This effort is generally only necessary for Significant and Intermediate projects. These entities may include but are not limited to representatives from SCDOT offices, FHWA, contractors, local government, public transportation providers, law enforcement, emergency services, local businesses, schools, and community groups.

- **Establishment of Transportation Management Plan Teams**

For each Major TMP, the SCDOT will organize a Transportation Management Plan Team to assist the designers during the development of the TMP, monitor the TMP during implementation for evaluation of effectiveness, and provide constructive input as necessary during implementation of each Major TMP. Through a multi-disciplinary approach, each TMP Team will consist of representatives from entities directly involved in project development, contract administration, project construction, traffic operations, and public relations.

The Pre-Construction or Maintenance and Traffic Engineering offices and the FHWA will coordinate and establish the representative requirements for a Transportation Management Plan Team for each Major TMP for projects with plans prepared by the SCDOT.

The Pre-Construction and Traffic Engineering offices and the FHWA will coordinate and establish the representative requirements for a Transportation Management Plan Team for each Major TMP for projects with plans prepared by consultants. The consultant is responsible for design, development, and preparation of the TMP. The TMP Team will only act in an advisory role on these projects through the project development process. Upon implementation of the TMP, the TMP Team will become fully operational.

The Construction and Traffic Engineering offices and the FHWA will coordinate and establish the representative requirements for a Transportation Manage Plan Team to review the TMP submittals for Design-Build projects.

Utilize *Table 4 – Transportation Management Team (Potential Representatives)* when considering and selecting members of each TMP Team.

Specific members of the Transportation Management Teams from the SCDOT will be selected by the office Directors and the District Engineering Administrators.

**Table 4. Transportation Management Team (Potential Representatives)**

<b>Project Plans Prepared by SCDOT</b>	<b>Project Plans Prepared by Consultant</b>	<b>Design - Build</b>
<p><b><u>SCDOT Representative Offices</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Planning</li> <li><input type="checkbox"/> Pre-Construction</li> <li><input type="checkbox"/> Construction</li> <li><input type="checkbox"/> Maintenance</li> <li><input type="checkbox"/> Safety</li> <li><input type="checkbox"/> Traffic Engineering</li> <li><input type="checkbox"/> Engineering District Offices</li> <li><input type="checkbox"/> Resident Engineer Offices</li> <li><input type="checkbox"/> Communications</li> </ul> <p><b><u>External Representatives</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> FHWA</li> <li><input type="checkbox"/> Association of General Contractors</li> <li><input type="checkbox"/> Law Enforcement (Safety Improvement Team)</li> <li><input type="checkbox"/> Regional Associations (Impacted by the Work)</li> <li><input type="checkbox"/> Local EMS</li> <li><input type="checkbox"/> Fire Departments</li> <li><input type="checkbox"/> Transit Agencies</li> <li><input type="checkbox"/> SC Department of Education (Pupil Transportation Division)</li> </ul>	<p><b><u>SCDOT Representative Offices</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Consultant</li> <li><input type="checkbox"/> Planning</li> <li><input type="checkbox"/> Pre-Construction</li> <li><input type="checkbox"/> Construction</li> <li><input type="checkbox"/> Maintenance</li> <li><input type="checkbox"/> Safety</li> <li><input type="checkbox"/> Traffic Engineering</li> <li><input type="checkbox"/> Engineering District Offices</li> <li><input type="checkbox"/> Resident Engineer Offices</li> <li><input type="checkbox"/> Communications</li> </ul> <p><b><u>External Representatives</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> FHWA</li> <li><input type="checkbox"/> Association of General Contractors</li> <li><input type="checkbox"/> Law Enforcement (Safety Improvement Team)</li> <li><input type="checkbox"/> Regional Associations (Impacted by the Work)</li> <li><input type="checkbox"/> Local EMS</li> <li><input type="checkbox"/> Fire Departments</li> <li><input type="checkbox"/> Transit Agencies</li> <li><input type="checkbox"/> SC Department of Education (Pupil Transportation Division)</li> </ul>	<p><b><u>SCDOT Representative Offices</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Design-Build Firm</li> <li><input type="checkbox"/> Pre-Construction</li> <li><input type="checkbox"/> Construction</li> <li><input type="checkbox"/> Maintenance</li> <li><input type="checkbox"/> Safety</li> <li><input type="checkbox"/> Traffic Engineering</li> <li><input type="checkbox"/> Engineering District Offices</li> <li><input type="checkbox"/> Resident Engineer Offices</li> <li><input type="checkbox"/> Communications</li> </ul> <p><b><u>External Representatives</u></b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> FHWA</li> <li><input type="checkbox"/> Association of General Contractors</li> <li><input type="checkbox"/> Law Enforcement (Safety Improvement Team)</li> <li><input type="checkbox"/> Regional Associations (Impacted by the Work)</li> <li><input type="checkbox"/> Local EMS</li> <li><input type="checkbox"/> Fire Departments</li> <li><input type="checkbox"/> Transit Agencies</li> <li><input type="checkbox"/> SC Department of Education (Pupil Transportation Division)</li> </ul>

#### **4. TMP Development**

Develop the TMP by utilizing a combination of construction staging, project design, TTC strategies, TO strategies, and PI strategies. The work zone management strategies should incorporate the project constraints, staging plans, type of work, type of work zone, and the anticipated work zone impacts. Consider cost as a probable constraint and provide the appropriate pay items for implementation of the TMP.

The TMP team should consider costs versus benefits. These costs will include but are not limited to right-of-way costs, additional construction costs, user costs, travel delay, detour costs and impacts, accident potential, environmental impacts, and business and community impacts.

The TMP will include performance standards to facilitate an effective evaluation and assessment process to determine if the TMP complies with the requirements of SCDOT policies, standards, and procedures during implementation of the TMP during the work phase of the project. The performance

standards may include but are not limited to performance of lane closure, shoulder closure, and road closure restrictions, travel time and delay, queue lengths, number and severity of incidents, incident response and clearance times, user costs, contractor incidents, motorists and community complaints, etc.

## **5. Monitor TMP Development / Evaluate**

The TMP is a “Dynamic Document”. The TMP team is responsible for monitoring and providing constructive input that may include recommendations for revising the TMP as the project progresses through the project development process. A TMP team should evaluate current data and information as it becomes available. Evaluation of the latest data and information may indicate project reclassification as an appropriate action and compel a TMP team to reclassify a Significant project as Intermediate or Basic.

## **6. Finalize TMP / Re-Evaluate Proposed TMP**

Upon completion of the proposed TMP, the TMP team should conduct a final evaluation of the TMP. Develop and incorporate any necessary revisions to the TMP prior to implementation.

## **7. Implement the TMP**

Implement the TMP. Some components of the TMP, such as a public relations campaign or improvements to detour routes, may require implementation prior to beginning work relative to execution of the project.

For the requirements for the persons responsible for implementing of the TMP, see the section entitled, *“Responsible Persons for Implementing the Transportation Management Plan”*.

## **8. Monitor the TMP Field Performance**

The TMP team will review the quarterly reports provided by the persons responsible for implementing the TMP to evaluate the performance of the TMP during the work phase of the project. When evaluating the effectiveness of the TMP, the TMP team will grade the performance in accordance with the performance standards included in the TMP to determine if the TMP performance is acceptable and in compliance with SCDOT policies, standards, and procedures. When the performance of the TMP is determined to be acceptable and in compliance with SCDOT policies, standards, and procedures, proceed to Step 11, otherwise proceed to Step 9.

## **9. TMP Update / Revisions Per TMP Evaluations**

When periodic evaluations of the TMP performance indicate inadequacies, the TMP team will consider alternate strategies and provide recommendations for revisions to the TMP.

#### **10. Evaluate TMP Update**

When revisions to the TMP are necessary, repeat “*Step 8. Monitor the TMP Field Performance*” upon completion of the installation of any revisions. The TMP team will repeat Steps 8 and 9, relative to implementation of the revisions, until the TMP performance is considered acceptable and in compliance with SCDOT policies, standards, and procedures.

#### **11. Post Project TMP Evaluation and Performance Assessment**

Upon completion of the project, the TMP team will prepare a concise evaluation of the TMP. Include successes and failures, revisions made to the TMP and the results of those revisions, public feedback, actual conditions versus those predicted, cost for implementation of the TMP, and recommended improvements.



**Table 5A. Work Zone Management Strategy Options for Transportation Management Plan - Temporary Traffic Control (TTC)**

<b>TEMPORARY TRAFFIC CONTROL (TTC)</b>		
<b>TRAFFIC CONTROL STRATEGIES</b>	<b>TRAFFIC CONTROL DEVICES</b>	<b>PROJECT COORDINATION, CONTRACTING AND INNOVATIVE CONSTRUCTION STRATEGIES</b>
<input type="checkbox"/> Construction staging <input type="checkbox"/> Road closures <ul style="list-style-type: none"> <li>Extended (Days, weeks, months)</li> <li>Temporary (Periodic not to exceed 20 minutes)</li> </ul> <input type="checkbox"/> Off-site detours / Alternate routes <input type="checkbox"/> Lane closures, width reductions, or shifts <ul style="list-style-type: none"> <li>Lane closures to conduct work and provide worker safety</li> <li>Shoulder closures to conduct work and provide worker safety</li> <li>Reduced lane widths to maintain number of lanes</li> <li>Reduced shoulder width to maintain number of lanes</li> <li>Lane shift to shoulders to maintain number of lanes</li> </ul> <input type="checkbox"/> Reduction of four lane divided highway with earth median to two-lane two-way traffic separated by temporary concrete barrier wall <input type="checkbox"/> Reduction of four lane divided highway with painted median to two-lane two-way traffic separated by pavement markings and delineator posts <input type="checkbox"/> One-lane, two-way operation	<input type="checkbox"/> Channelizing devices <ul style="list-style-type: none"> <li>Portable plastic drums</li> <li>Standard traffic cones</li> <li>Oversized traffic cones</li> </ul> <input type="checkbox"/> Barricades <ul style="list-style-type: none"> <li>Type II barricades</li> <li>Type III barricades</li> </ul> <input type="checkbox"/> Temporary signs <ul style="list-style-type: none"> <li>Warning</li> <li>Regulatory</li> <li>Guide / information</li> </ul> <input type="checkbox"/> Temporary longitudinal barriers <ul style="list-style-type: none"> <li>Concrete</li> <li>Polyethylene water-filled</li> <li>Structural steel</li> </ul> <input type="checkbox"/> Work zone attenuators <ul style="list-style-type: none"> <li>Truck mounted attenuators</li> <li>Portable terminal impact attenuators</li> </ul> <input type="checkbox"/> Arrow panels <ul style="list-style-type: none"> <li>Trailer mounted</li> <li>Truck mounted</li> </ul> <input type="checkbox"/> Changeable message signs <ul style="list-style-type: none"> <li>Trailer mounted</li> <li>Truck mounted</li> </ul>	<input type="checkbox"/> Project coordination <ul style="list-style-type: none"> <li>Coordination with adjacent projects</li> <li>Right-of-way coordination</li> <li>Utilities coordination</li> <li>Coordination with other transportation infrastructure</li> </ul> <input type="checkbox"/> Contracting strategies <ul style="list-style-type: none"> <li>A + B bidding</li> <li>Design-build</li> <li>Incentive / disincentive clauses</li> <li>Lane rental</li> </ul> <input type="checkbox"/> Innovative construction techniques (precast elements, rapid cure materials, etc.)

(Continued Next Page)

**Table 5A. Work Zone Management Strategy Options for Transportation Management Plan - Temporary Traffic Control (TTC)**  
(Continued)

TRAFFIC CONTROL STRATEGIES	TRAFFIC CONTROL DEVICES	PROJECT COORDINATION, CONTRACTING AND INNOVATIVE CONSTRUCTION STRATEGIES
<ul style="list-style-type: none"> <li><input type="checkbox"/> Traffic split - Four lane divided highway with earth median - Separate travel lanes of one direction by relocation of one lane to opposing side of median after shifting opposing direction of traffic to provide sufficient space; separate opposing directions of traffic with temporary concrete barrier wall</li> <li><input type="checkbox"/> Reversible lanes</li> <li><input type="checkbox"/> Ramp closure / relocation</li> <li><input type="checkbox"/> Traffic pacing</li> <li><input type="checkbox"/> Freeway to freeway interchange closure</li> <li><input type="checkbox"/> Hourly prohibition restrictions for lane closures, shoulder closures, and temporary road closures</li> <li><input type="checkbox"/> Work hour restrictions for peak hour traffic</li> <li><input type="checkbox"/> Night work</li> <li><input type="checkbox"/> Weekend work</li> <li><input type="checkbox"/> Business access improvements</li> <li><input type="checkbox"/> Pedestrian / bicycle access improvements</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Temporary traffic signals <ul style="list-style-type: none"> <li>• Ground / pole mounted</li> <li>• Trailer mounted</li> </ul> </li> <li><input type="checkbox"/> Lighting devices <ul style="list-style-type: none"> <li>• Ground / pole mounted</li> <li>• Trailer mounted</li> </ul> </li> <li><input type="checkbox"/> Supplemental traffic control devices <ul style="list-style-type: none"> <li>• Warning lights</li> <li>• Temporary glare shields</li> </ul> </li> <li><input type="checkbox"/> Flaggers</li> <li><input type="checkbox"/> Law enforcement officers</li> <li><input type="checkbox"/> Temporary pavement markings <ul style="list-style-type: none"> <li>• Waterborne fast dry paint</li> <li>• Thermoplastic</li> <li>• Epoxy</li> <li>• Type 2 Temporary – removable preformed flexible retroreflective pavement markings</li> <li>• Temporary raised pavement markers</li> </ul> </li> </ul>	

**Table 5B. Work Zone Management Strategy Options for Transportation Management Plan - Transportation Operations (TO)**

<b>TRANSPORTATION OPERATIONS (TO)</b>			
<b>Demand Management Strategies</b>	<b>Corridor / Network Management Strategies</b>	<b>Work Zone Safety Management Strategies</b>	<b>Traffic / Incident Management And Enforcement Strategies</b>
<input type="checkbox"/> Variable work hours (Flex-time) <input type="checkbox"/> High-Occupancy Vehicle (HOV) lanes <input type="checkbox"/> Park-and-Ride promotion <input type="checkbox"/> Rideshare / carpool incentives <input type="checkbox"/> Shuttle services <input type="checkbox"/> Transit incentives <input type="checkbox"/> Transit service <input type="checkbox"/> Toll / congestion pricing	<input type="checkbox"/> Traffic signal timing / coordination revisions <input type="checkbox"/> Temporary traffic signals <input type="checkbox"/> Street / intersection improvements <input type="checkbox"/> Turn restrictions <input type="checkbox"/> Parking restrictions <input type="checkbox"/> Truck / heavy vehicle restrictions <input type="checkbox"/> Separate truck lanes <input type="checkbox"/> Reversible lanes <input type="checkbox"/> Dynamic lane closure system <input type="checkbox"/> Ramp metering <input type="checkbox"/> Ramp closures <input type="checkbox"/> Coordination with adjacent construction sites <input type="checkbox"/> Railroad crossings controls	<input type="checkbox"/> Temporary traffic signals <input type="checkbox"/> Temporary longitudinal barriers <ul style="list-style-type: none"> <li>• Concrete</li> <li>• Polyethylene water-filled</li> <li>• Structural steel</li> </ul> <input type="checkbox"/> Moveable traffic barrier systems <input type="checkbox"/> Work zone attenuators <input type="checkbox"/> Warning lights <input type="checkbox"/> Temporary rumble strips <input type="checkbox"/> Speed limit reduction <input type="checkbox"/> Intrusion alarms <input type="checkbox"/> Construction safety supervisors / inspectors <input type="checkbox"/> Road safety audits <input type="checkbox"/> TMP monitor / inspection team <input type="checkbox"/> On-site safety training <input type="checkbox"/> Project task force / committee <input type="checkbox"/> Safety awards / incentives	<input type="checkbox"/> Increased penalties for work zone violations <input type="checkbox"/> Project dedicated law enforcement <input type="checkbox"/> Cooperative law enforcement <input type="checkbox"/> Incident / emergency management coordinator <input type="checkbox"/> Incident / emergency response plan <input type="checkbox"/> Wrecker service <input type="checkbox"/> Local detour routes <input type="checkbox"/> Coordination with media <input type="checkbox"/> Contract support for incident management <input type="checkbox"/> ITS for traffic monitoring / management <input type="checkbox"/> Transportation Management Center (TMC) <input type="checkbox"/> Surveillance (Closed-Circuit Television, loop detectors, lasers) <input type="checkbox"/> Traffic screens <input type="checkbox"/> Mile-post markers <input type="checkbox"/> Call boxes <input type="checkbox"/> Aerial surveillance

**Table 5C. Work Zone Management Strategy Options for Transportation Management Plan - Public Information (PI)**

<b>PUBLIC INFORMATION (PI)</b>	
<b>PUBLIC AWARENESS STRATEGIES</b>	<b>MOTORISTS INFORMATION STRATEGIES</b>
<ul style="list-style-type: none"> <li><input type="checkbox"/> Press releases / media alerts</li> <li><input type="checkbox"/> Public hearings / meetings</li> <li><input type="checkbox"/> Web site (lane closure, detour, etc. information)</li> <li><input type="checkbox"/> Brochures and mailers</li> <li><input type="checkbox"/> Public information center</li> <li><input type="checkbox"/> Work zone safety and education campaigns</li> <li><input type="checkbox"/> Coordination with media / emergency services / schools / businesses</li> <li><input type="checkbox"/> Paid advertisements</li> <li><input type="checkbox"/> Telephone hotline</li> <li><input type="checkbox"/> Community task forces</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> TV / radio traffic information</li> <li><input type="checkbox"/> Changeable message signs</li> <li><input type="checkbox"/> Temporary motorists information signs</li> <li><input type="checkbox"/> Dynamic speed message signs</li> <li><input type="checkbox"/> Highway advisor radio (HAR)</li> <li><input type="checkbox"/> Transportation Management Center (TMC)</li> <li><input type="checkbox"/> 511 traveler information systems</li> <li><input type="checkbox"/> Freight travel information</li> </ul>

**14. Responsible Persons - Implementing the Transportation Management Plan**

The SCDOT and the entity responsible for conducting the work shall each designate a Responsible Person; a Responsible Person is defined as a representative individual at the project level who is responsible for and has the authority to implement the TMP. The Responsible Person for the SCDOT will typically be the Resident Engineer or a designated representative acting on behalf of the SCDOT.

Minimal requirements for each Responsible Person shall include successful completion of the advance work zone training course(s) required by the SCDOT.

The Responsible Persons shall make personal observations and evaluations of the TMP during implementation and throughout the life of the project. When concerns or problems arise, the Responsible Persons should confer with each other and attempt to eliminate the concerns and problems at the project level when possible. When elimination of concerns and problems at the project level are not possible, forward the findings through the routine chain of command. When necessary, the final responsibility for addressing the concerns and problems reside with the TMP team.

The Responsible Persons shall provide written quarterly reports to the TMP team. Also, the Responsible Persons will provide copies of the quarterly reports to the Project Review team upon request. These written quarterly reports should include but are not limited to the following:

- Traffic Operations Summary
  - Lane closure, shoulder closure, and road closure restrictions - Performance impacts
  - Traffic delays - Causes, Distances, Durations, Times of day, Locations, etc.
  - Queue Lengths
  - Staging plans - Positive and Negative Aspects
  - Traffic control devices - Adequacy of types, quantities, placement, etc.
- Incident Summary
  - Crashes/Collisions
    - Severity
    - Number
    - Response and clearance times
  - Contractor
    - Equipment breakdowns
    - Equipment conflicts with traffic
    - Significant employee injuries and any employee fatality
    - Work methods conflicts with traffic
  - Weather Emergency
  - Civil Emergency
- Project Level Revisions / Modifications
  - Types
  - Number
  - Performance impacts
- Public Comments - Positive and Negative
  - Motorists
  - Local community
  - Local government
  - Law enforcement
- Personal Observations
  - SCDOT Representative
    - Project Experiences - Positive and Negative
    - Transportation Management Strategies - Performance levels
    - Recommendations
  - Contractor Representative
    - Project Experiences - Positive and Negative
    - Transportation Management Strategies - Performance levels
    - Recommendations

## **Part II**

### **Maintenance of The Policy for Work Zone Safety and Mobility**

#### **1.0     Reviews for Evaluation and Refinement of The Policy**

The SCDOT will establish project and policy review teams to evaluate the effectiveness of The Policy. In the event the results of the performance assessments are considered unacceptable, the Policy Review Team, as previously described in The Policy, will develop and recommend revisions to The Policy to fulfill SCDOT expectations to the Deputy Secretary for Engineering for consideration and possible implementation.

#### **2.0     Review Teams**

##### **Project Review Team**

This team will review no less than three (3) Significant projects annually. The team will gather field data and the results from any other individual project reviews to evaluate the performance of the Transportation Management Plan for each Significant project evaluated. Work zone field data shall include the following:

- Quarterly Reports
- Daytime Field Inspection
- Nighttime Field Inspection

Work zone field data may also include the following:

- Field Diaries
- Other traffic control reviews
- Real-time and archived data from intelligent transportation systems

The members of the Project Review Teams will represent entities directly impacted by the projects. However, to assure the integrity of the findings and determinations of a Project Review Team, the individual team members should have no direct association or involvement with the projects under review when practical. Specific members of the Project Review Teams from the SCDOT will be selected by the office Directors and the District Engineering Administrators. Through a multi-disciplinary approach, consider representatives from the following:

**SCDOT Representative Offices -**

- Planning
- Pre-Construction
- Construction
- Maintenance
- Safety
- Traffic Engineering
- Engineering District Offices
- Resident Engineer Offices
- Communications

**External Representatives -**

- FHWA
- Association of General Contractors
- Law Enforcement
- Regional Associations (Impacted by the work)
- State EMS
- Transit Agencies
- SC Department of Education/ Pupil Transportation Division

**Policy Review Team**

This team will analyze and evaluate work zone data compiled from multiple Project Reviews to determine the level of performance of The Policy and to identify trends and possible common problems that may be remedied by modification of The Policy. The Policy Review Team will convene no less than once every two (2) years.

The Policy Review Team will include a representative from Planning, Pre-Construction, Construction, Maintenance, Safety, Traffic Engineering, Communications, two District Representatives, and FHWA. The Policy Review team will be chaired by the SCDOT Work Zone Traffic Control Coordinator. The team will report its findings and recommendations to the Deputy Secretary for Engineering.

The Policy Review Team will manage implementation and maintenance of The Policy under the authority of the Deputy Secretary for Engineering.



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The members of the Policy Review Team will have past service on no less than one Project Review team to assure familiarity with the aspirations of The Policy and SCDOT policies, standards, and procedures.

The Policy Review Team will utilize the evaluations to submit recommendations to the Deputy Secretary for Engineering to refine The Policy over time to improve work zone programs, processes, procedures, and practices to ensure effective management of work zone safety and mobility.

Also, the Policy Review Team will review the processes for classifying projects and identifying Significant projects and the latest listing of project types maintained for blanket exceptions as Significant projects. The Policy Review Team will determine if revisions are necessary.

## **Part III**

### **Safety Requirements of The Policy for Work Zone Safety and Mobility**

#### **Work Zone Safety Training Program Requirements**

SCDOT shall require the appropriate training for those persons involved in the development, design, implementation, operation, inspection, enforcement, and effectiveness of the work zone traffic control and the transportation management plan. The requirement for appropriate training may also include SCDOT staff responsible for decisions and policies, information officers, law enforcement, incident responders, and designated representatives acting on behalf of the SCDOT. Also, the SCDOT will require the appropriate training for consultants, contractors, utilities and local government personnel. The SCDOT will require periodic training updates to address changes in the highway construction industry as determined necessary.

All training will be relevant to the responsibilities of the individuals in relation to implementation of The Policy.